UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET
ATLANTA, GEORGIA 30365

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PERMITS & ENGINEERING

4E-CP

Mr. Robert F. Helms, Director
Division of Environmental Management
North Carolina Department of Natural
 Resources and Community Development
Post Office Box 27687
Raleigh, North Carolina 27611

Re: Mayo Electric Generating Plant
 NPDES Permit No. NC0038377

Dear Mr. Helms:

In accordance with the Clean Water Act, 33 U.S.C. 1251 et. seq., and the State-EPA Memorandum of Agreement, we have reviewed the Revised Draft Permit for the referenced facility. I have concluded that under its present provisions, this permit is outside the guidelines and requirements of the Act, and consequently, pursuant to section 402(d)(2) of the Act and 40 CFR 123.75, I object to its issuance.

This letter is to provide notification of the objections to issuance of the permit. Set forth in Attachment A are the bases upon which the objections are made. Additional comments and suggestions are included in Attachment B. A listing of conditions and limitations required to satisfy the objections will be forthcoming within 90 days from May 29, 1981 (date of EPA receipt of permit), pursuant to 40 CFR 123.75. In the interim, it would be appreciated if you would provide us with a copy of the rationale or statement of basis for this permit.

One major aspect of this project, the transport of fly ash, requires further consideration in my opinion. While the October 1974 regulation requiring dry fly ash handling was remanded in 1976, the October 1980 proposed revisions to 40 CFR 423 again proposed dry fly ash handling as a performance standard for new sources. Even though no national standard presently exists for dry fly ash handling, it is recommended that a case-by-case determination of whether dry fly ash handling is appropriate for the Mayo plant should be attempted. Some of the factors leading to this recommendation include:

1. Dry fly ash removal facilities are to be provided in plant design with subsequent sluicing capability to the ash ponds.

2. Incremental additional cost of trucking and disposal of fly ash is stated as $1500.00 per day (Final Environmental Impact Statement page 6-12).

3. Assuming a 60 percent capacity factor for the 1440 MW facility (20.7 million kwh/day), an incremental cost of only 0.007 cents/kwh for dry ash disposal would be required.

4. Significant impact to aquatic organisms in the Mayo Creek makeup water reservoir, similar to those at Belews Lake (and probably in Hyco Lake also) can be anticipated. This will be due to the discharge of selenium directly attributable to sluicing of fly ash and discharge of ash sluice waters.

5. Compliance with Water Quality Standards requirements for selenium in Crutchfield Branch cannot be assured once fly ash has been sluiced to the ash pond and subsequent leaching to Crutchfield Branch has begun.

6. Treatment to remove selenium from ash sluice waters and lake waters once a biological impact becomes apparent would be extremely costly and would take a considerable period of time.

Staff of this office will be available to assist you in this endeavor, should you desire it.

Should you have any questions relative to the objections, suggestions or comments, do not hesitate to contact us.

Sincerely yours,

Howard D. Zeller
Acting Director
Enforcement Division

Attachment A
Mayo Electric Generating Plant
Objections to Permit Issuance

1. OSN 001 - Cooling tower blowdown.

   a. Column headings are inconsistent with chlorine discharge requirements of 40 CFR 423.15(i) which limits FAC to 0.5 mg/l as an instantaneous maximum and 0.2 mg/l as an average over the individual chlorine discharge periods in any one day.

   b. Provisions of 423.15(j) have not been included in the permit. The provisions must be included unless a significantly reduced limitation is included in the permit (See Attachment B, Item 1.e.).

   c. Use of concentration factors of only two to four does not appear consistent with the requirements of 423.11(e) which requires "minimization." Concentration factors of five to eight are not unusual for new source power plants in Region IV. Use of higher concentration factors results in a significant reduction in the makeup and blowdown rates and the quantity of FAC and TRC discharged. If blowdown is to the ash pond, no allowance can be made for TSS due to the potential for transfer of pollutants from other waste categories.

2. OSN 002 - Ash pond

   a. Quantity Limitations. Quantity limitations appear to be based on a once-through ash sluice flow rate of 13 MGD. Section 423.15(d) requires that limitations for bottom ash be reduced by a factor of 20. Footnote 2 indicates that limitations are based only on bottom ash transport and is incorrect.

   b. Monitoring of TSS and Oil and Grease at a frequency of "monthly" is inadequate in our opinion to assure compliance with permit conditions and standards of performance for new sources. See 40 CFR 123.75(c)(5). Monitoring frequency of not less than one/week would be adequate for this new source discharge. Subsequent to development of a data base after the plant becomes operational, reduction in frequency could be considered.

c. Concentration limitations should be included in the permit in accordance with 40 CFR 122.63(f)(2) for TSS and Oil and Grease (Selenium also, but this is addressed later). Since limitations for bottom ash sluice water are different from low volume waste (and possibly fly ash sluice, if allowed), due to the technological requirement of bottom ash sluice recycle, calculation of concentration limitations must be based on a flow weighting of waste categories which are to be cotreated in the ash pond. It is to be noted that the applicant has not proposed a recycled ash sluice system for bottom ash handling consistent with the Development Document. In the absence of such a system, it is unclear as to how the NSPS 10-year protection period would be affected. Clarification from Headquarters will be sought.

d. Since Unit 1 will be operational for two or more years before Unit 2, quantity limitations for one unit operation are necessary.

3. OSN 004 - Boiler blowdown. Unless discharge is to the ash pond, pH limitations are applicable.

4. OSN 005 - Metal cleaning wastes. Definition of metal cleaning wastes in the draft permit (also OSN 006) is inconsistent with the October 1974 regulations and Development Docment. While Region IV has concurred with use of the "Jordan Memo" for existing facilities where significant costs would be encountered in repiping and treatment, it is and has been our position that adequate treatment facilities must be included for new source plants. Regulations proposed in October 1980 have not changed this requirement.

5. OSN 006 - Low volume wastes.

a. Quantity limitations are required by 40 CFR 122.63 and 423. Use of a "quantity sentence" for this nearly continuous waste stream is not acceptable.

b. Definition of low volume wastes is inconsistent with regulations. See Item 4.a. above.

c. Monitoring frequency is not considered adequate. See Item 2.b. above.

6. Part III. Our records do not indicate that a preliminary finding under Section 316(b) of the CWA has been made. Details of any such finding should be provided to this office. Subsequently, we may comment further on the need for biological monitoring of intake impacts.

7. Water Quality Standards Compliance.
In our opinion, limitations for selenium and chlorine provided in the Draft permit (and possibly other metals) will not comply with toxicity requirements of the North Carolina Water Quality Standards. Chapter 2, Subchapter 2B.0208 requires that "the concentration of toxic substances in the receiving water...shall not exceed one-one hundredth (0.01) of the 96-hour LC50..." Since no mixing zone has been proposed under 2B.0204(b), limitations proposed in the Draft Permit are inconsistent with the standards. Even should a mixing zone be proposed, it is probable that present limitations for chlorine and selenium would exceed the 96-hour LC50 concentration for "sensitive" species which will inhabit the Lake, i.e., cause mortality within the mixing zone (2B.0204(1)). Neither is it assured that the proposed limitation for selenium would provide for a suitable environment in the lake for propagation of fish and other aquatic life as required in 2B.0202(5). Data from Belews Lake indicate that much lower levels of selenium may be necessary to assure fish reproduction.

The proposed limitations for selenium of 3.8 pounds per day would yield a concentration of 0.035 mg/l at 13 MGD. However, flows provided by the applicant for two units appear high (See Attachment B, Item 1.a.) and therefore, during one unit operation or at flows less than 13 MGD, concentrations above 0.035 mg/l would be allowed in the discharge by present permit conditions. Concentration limitations for selenium, as well as quantity limitations, for discharges to the Lake and a concentration limitation in Crutchfield Branch below the ash pond are necessary in the permit at levels which will assure compliance with North Carolina Water Quality Standards requirements.

Modeling by the applicant, as discussed in the Final Environmental Impact Statement, indicated that Water Quality Standards would not be achieved at the dam, with an effluent concentration of 0.03 mg/l in the ash pond effluent, even if 70 percent of the reservoir was available as a mixing zone. However, the

proposed permit would allow 0.035 mg/l or more in the effluent. No detailed rationale to support this higher limitation and no information on the necessary mixing zone size were provided to us. Additionally, data available for the Roxboro ash pond for Units 3 and 4 indicates that three of four effluent values (0.05, 0.03, 0.04 and 0.04) exceeded this concentration in 1977. Significant impact to the Lake Hyco fishery has resulted in recent years (as at Belews Lake) and is considered to be due at least in part, to fly ash sluicing from and to the small lake.

Once fly ash has been sluiced to the pond, it will remain in the pond subject to future leaching into the water discharged from the pond or in leachate to ground water (and Crutchfield Branch). Conversion to dry ash handling after problems have been encountered will not alleviate the situation by itself. Should leaching and/or concentration to unacceptable levels occur, treatment would be extremely difficult, would be very costly, and would take a long period of time during which waters of the U. S. would be unsuitable for fish propagation. This situation has been demonstrated at Belews Lake (and is also probable at Lake Hyco). Therefore, it appears that serious consideration should be given to requiring dry fly ash handling or denying the application as proposed (See additional comment in the cover letter).

8. Environmental Conditions Relative to Groundwater Protection. The NPDES permit does not include conditions contained in the August 16, 1978, letter from the North Carolina Division of Environmental Management to the Corps of Engineers relative to groundwater protection studies and evaluations of seepage to Crutchfield Branch. Without a commitment that such studies would be required, the Final Environmental Impact Statement would not have been acceptable to EPA. The FEIS stated on page 2-6:

"In addition the N. C. Division of Environmental Management by letter of 16 August 1978 stipulated that certain conditions would be included in the NPDES permit as follows:

'1. The Company shall be required to complete the groundwater studies and provide controls as necessary for the prevention of pollutant materials from entering groundwater and thereby reentering the surface waters some point downstream of the proposed dam.

2. There shall be no discharge from the proposed ash settling pond to Crutchfield Branch except as may be provided by an NPDES permit issued for such discharge. All discharges from the ash pond not covered by such NPDES permit shall be discharged to the cooling water makeup pond for the project.

3. The Company shall provide such testing as is necessary to assure that pollutants are not discharged to the groundwaters and thereby to the downstream point of the Crutchfield Branch in violation of the provisions stated above.'

The Division indicated that 'We believe that by including this language in the NPDES permit for the Mayo project sufficient controls will be available to assure that examination of potential groundwater pollution is completed and that appropriate remedial action is taken by the Company prior to the completion of the project.' "

If these studies have been completed, we would appreciate receipt of a copy. If not, applicable conditions should be included in the permit as stipulated. We remain concerned that leachate from fly ash sluiced to the ash pond will produce levels significantly greater than 0.01 mg/l of selenium, 0.05 to 0.1 mg/l of arsenic, etc. Data from the Roxboro 3 and 4 ash pond from 1977 indicated values of 0.10, 0.16, 0.09 and 0.05 mg/l for arsenic. Data for selenium was included in comments above. Due to long contact time between fly ash particles and water in the pore interstices, concentrations several times greater than these would be expected within the deposited fly ash. If seepage to shallow groundwater is not prevented by positive barriers such as constructed clay or other liners, Water Quality Standards Criteria will be exceeded in Crutchfield Branch. Again, the need to require dry fly ash disposal to areas other than the proposed ash pond is indicated. Limitations and monitoring requirements for expected heavy metal pollutants downstream from the ash pond dam on Crutchfield Branch should be included in the permit.

Attachment B
Mayo Electric Generating Plant
Comments and Suggestions

1. OSN 001 - Cooling tower blowdown.

   a. Discharge of cooling tower blowdown to the ash pond should be precluded. Flows of up to 21 MGD far exceed ash sluice flows and will significantly decrease detention time in the ash pond. Such increased flows may result in increased washout of selenium, arsenic and other pollutants which would adversely impact aquatic organisms in the makeup water reservoir.

   b. To assure compliance with the two-hour per day release of total residual chlorine, it is suggested that the applicant be required to report "time of chlorine release" in minutes for each period of monitoring.

   c. It is suggested that monitoring be conducted 1/week by multiple grabs. This would be consistent with similar requirements in other power plant permits in North Carolina.

   d. Sample location for blowdown flow is needed. Also, pump logs may not be an applicable sample type, since it was our understanding that gravity discharge of blowdown is probable.

   e. An effluent limitation of 0.14 mg/l of TRC as an instantaneous maximum, with allowance for continuous discharge, is suggested in lieu of requirements of 423.15(i) and (j). Available data indicates that once chlorine is added to a cooling tower system, discharge of TRC will continue for significantly longer than two hours. However, data is available indicating that holdup of blowdown for a two- to three-hour period will result in only 0.1 mg/l or less of TRC remaining in the system. This limit should assure compliance with Water Quality Standards requirements and would also assure compliance with the BAT limit proposed by EPA in October 1980.

2. OSN 002 - Ash pond.

   a. Ash sluice flow rates appear to be high relative to units of similar size. Confirmation that flow rates are based on expected number of hours per day of ash sluicing and not on pump capacity appears desirable. Development of NSPS requirements for dry fly ash handling at the Mayo plant is recommended (See cover letter and Attachment A).

   b. Quantity limitations should reflect low volume wastes, etc., if cotreatment in the ash pond is allowed. It is recommended that flow monitoring be increased to definitely ascertain flows of any wastes discharged to the ash pond for cotreatment. Use of a paragraph similar to the following in Part III is suggested:
   "Subsequent to commercial operation dates of Units 1 and 2, respectively, the permittee shall conduct a detailed evaluation of actual water use and in-plant waste discharges to confirm design flow data. Reports of this evaluation shall cover a one-year period after startup of each unit and shall be submitted not later than 15 months after commercial operation date of each unit. In the event that actual flow data is significantly different from design data, permit may be modified by the Director."

   c. To assure compliance with Water Quality Standards and permit requirements in Mayo Creek, monitoring for selenium at or below the makeup reservoir dam should be required. Additionally, to assure that Water Quality Standards are maintained in Crutchfield Branch, monitoring below the ash pond dam is needed for the range of heavy metal pollutants expected. Levels of pollutants in leachate can be expected to be signficantly greater (order of magnitude) than in ash pond effluent (Also See Attachment A).

3. OSN 004 and 006. It is recommended that the permit be written consistent with the applicant's proposed treatment scheme. Plant design should be sufficiently advanced to determine whether wastes will go to the ash pond or will be directly discharged to the Lake.

4. Part III.E. This section should be revised consistent with 40 CFR 122.62(c) dated May 19, 1980.

5. Part III.F. It is recommended that this paragraph be deleted. The applicant has not proposed installation of a recycled bottom ash transport system (nor a dry fly ash disposed system) and it is not clear how possible revision of NSPS would impact this plant or its 10-year protection period. Clarification from headquarters will be sought. To the extent that 40 CFR 122.15 would allow permit modification, it need not be specifically included in the permit.

6. Flow releases during filling of the make-up water reservoir. The applicant apparently does not propose any release of water to Mayo Creek during the 2 1/2- to 4-year fill period. To assure continued integrity of Mayo Creek, minimum flow releases should be considered.